

Publishing ATLAS data through the OmegaCAM Science Archive

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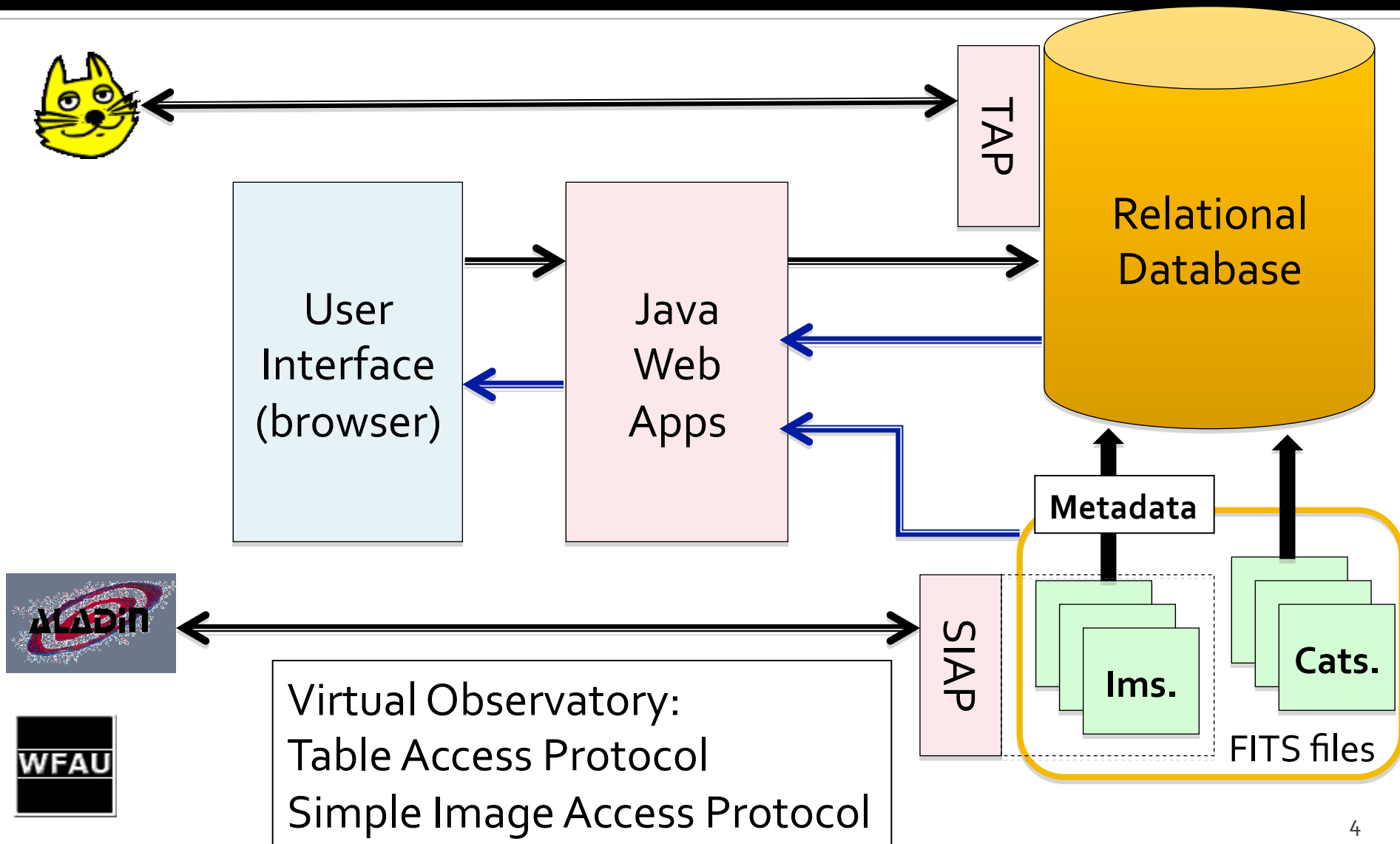
Outline

- VISTA Data Flow System science archives
- OmegaCAM Science Archive
 - Future plans
 - Current status
 - Known Issues

VISTA Data Flow System (2002-)

- Collaboration: CASU run nightly pipeline, WFAU generate further products & publish/archive
- 2006-: WFCAM Science Archive surveys.roe.ac.uk/wsa
 - UKIDSS, plus PI programmes
 - 1000+ registered users for proprietary UKIDSS data
 - DR10 (ESO proprietary), DR9 (world public)
- 2010-: VISTA Science Archive surveys.roe.ac.uk/vsa
 - 5/6 Public Surveys: VHS, VIDEO, VMC, VVV, VIKING
 - Many consortium releases; public ESO DR2s and DR3s

VDFS Science Archive architecture



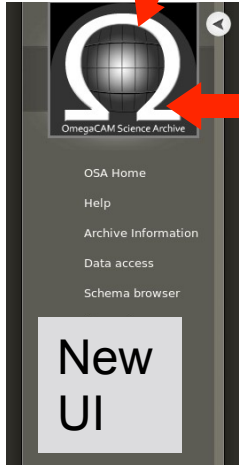
OmegaCAM Science Archive

- Supplement ESO's file repository functionality
 - Provide science archive supporting survey science
- Build on experience of WSA and VSA
 - Deliver the same functionality
 - Similar look and feel
- Testbed for new underlying archive infrastructure
 - Tighter integration with Virtual Observatory
 - Enabling additional functionality for users





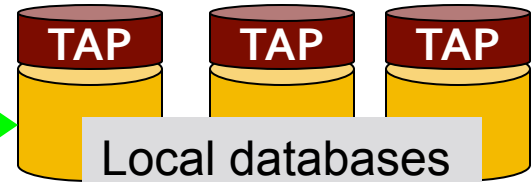
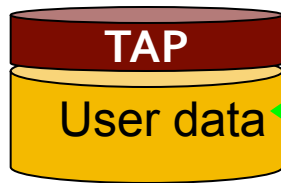
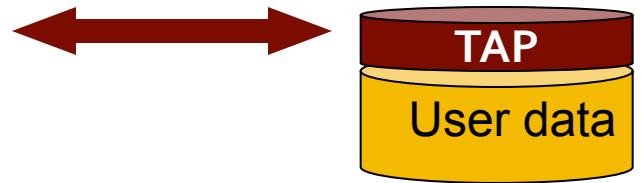
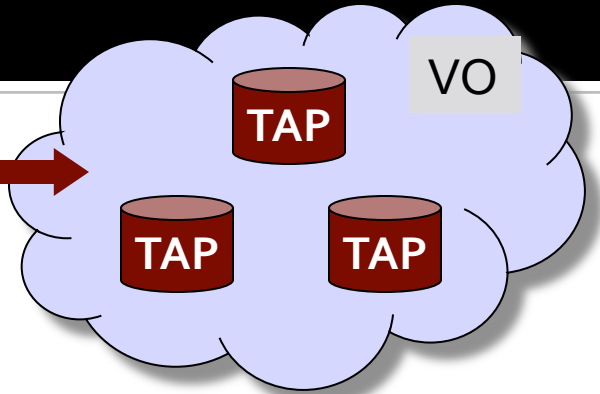
Goal



Web.py
python
service

Firethorn
metadata
layer

OGSA
-DAI



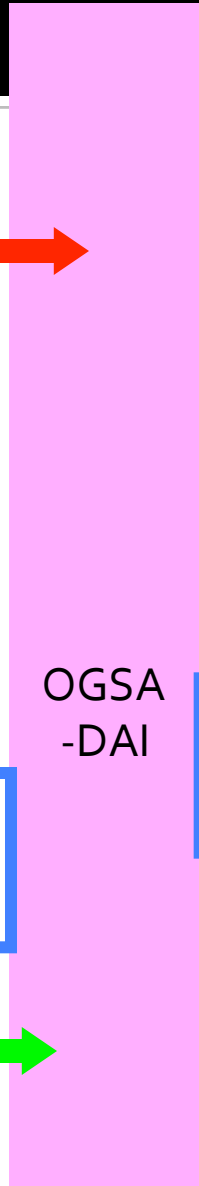


OSA v1

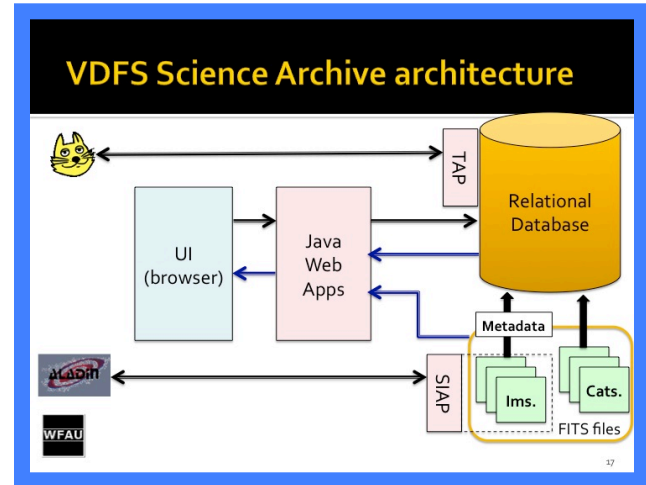


Web.py python service

Firethorn metadata layer

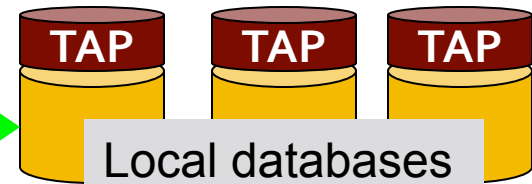
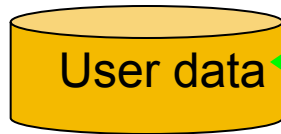


OGSA-DAI



Similar functionality
Different implementation

Remaining components prototyped, but not ready for deployment yet

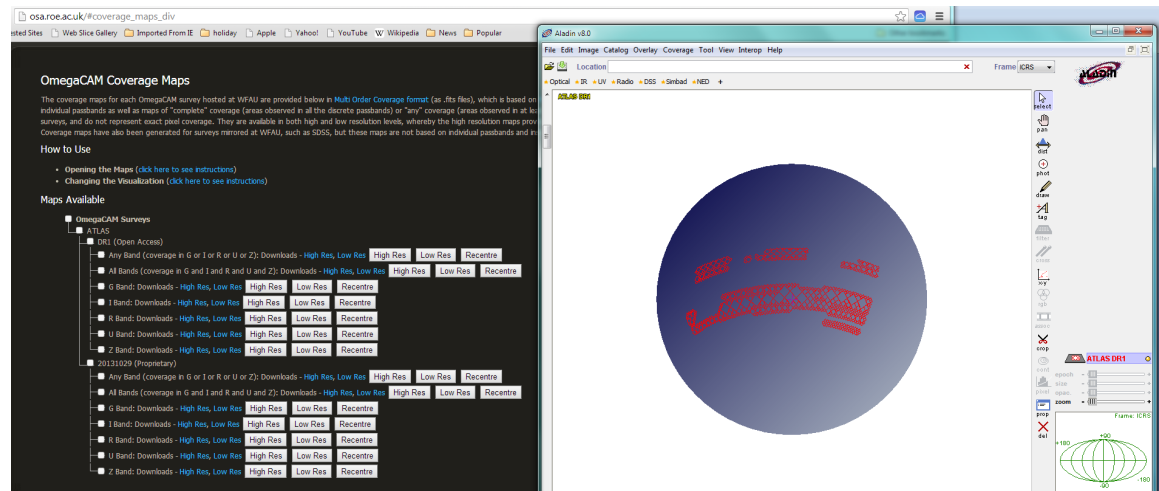


OSA current status

- Ingested all data taken to end of January 2014
 - (Few problem files from December to be replaced by CASU)
- Consortium releases
 - Latest: *ATLASv20131029* – data up to March 2013
 - Currently preparing release up to Pg1 (to Sept 2013)
 - Login credentials from Nigel Metcalfe
- Public releases
 - ATLAS DR₁ – same observations as ESO release

OSA v1 functionality

- Web forms
 - Flat-file download – filtered by file type
 - Image cut-outs – single position or list
 - Region search – (RA,Dec) or (l,b) box
- Coverage maps in MOC HEALPix format
 - Send to Aladin via WebSAMP



The image shows two side-by-side screenshots. The left screenshot is a web browser displaying the 'OmegaCAM Coverage Maps' page. The page title is 'OmegaCAM Coverage Maps' and it contains a list of available maps under the heading 'Maps Available'. The list is organized into two main sections: 'ATLAS' and '2013.1029 (Proprietary)'. Each section contains a tree view of survey bands (Any, G, I, R, U, Z) and resolution options (High Res, Low Res, Recentre). The right screenshot shows the Aladin v8.0 software interface. The main window displays a circular coverage map with a red grid pattern. The map is titled 'ATLAS DR1' and shows the distribution of survey fields. The interface includes a toolbar on the right and a status bar at the bottom.



OSA v1 functionality

- **Freeform query box**
 - Autocompletion using table metadata
 - “Cross-neighbour tables” enabling joins with: **SDSS (DR9), VHS, VIKING, WISE,** plus DENIS, FIRST, GLIMPSE, GALEX GR6, IRAS, MGC, NVSS, ROSAT, 2MASS, 2XMM

- Results can be sent to TOPCAT using WebSAMP



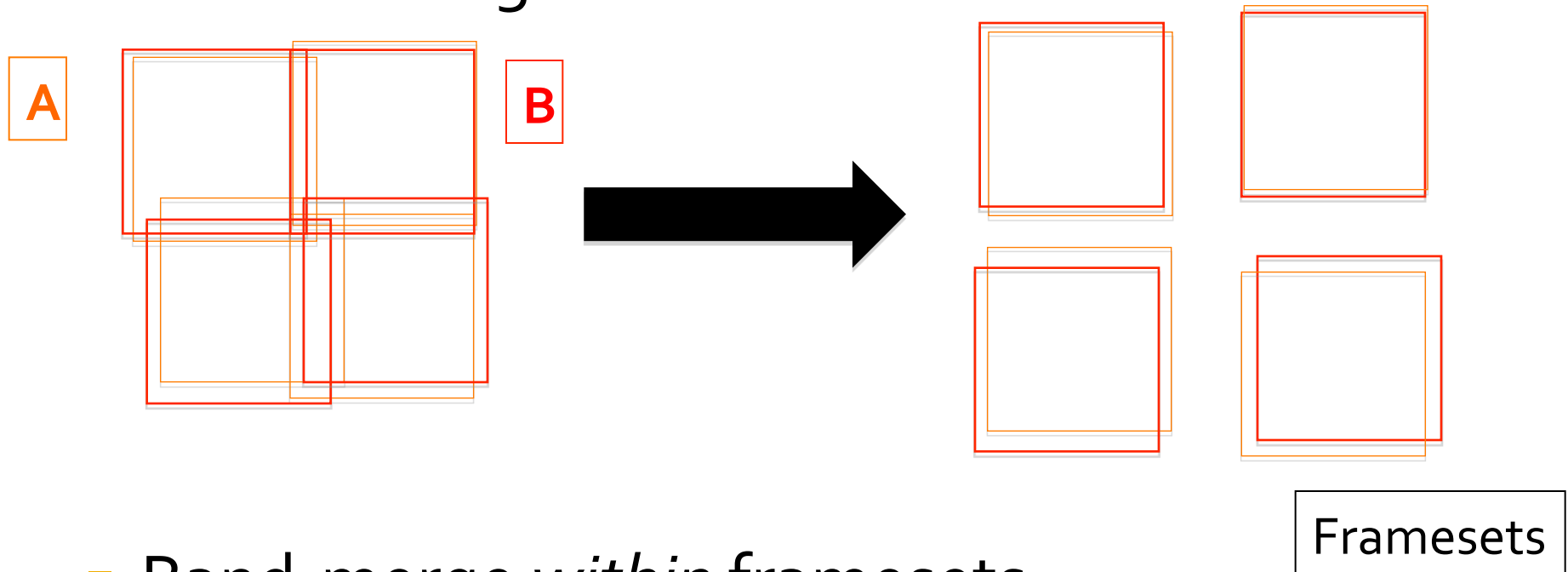
The screenshot displays the OSA v1 interface. At the top, there is a query box containing the text "select top 100 * from allsource". Below the query box is a "Send Query" button. To the right, a "Database(s)" dropdown menu is visible. Below the query box, there is a "Launch in Plotter" button and a "Query ID [+]" button. Below the query box, there is a "Disconnect from SAMP" button and a "Broadcast results table" button. Below the query box, there is a "Show / hide columns" dropdown menu and a "Show [x] entries" dropdown menu. Below the query box, there is a table with columns: sourceID, cIdEventID, frameSetID, ra, dec, cx, cy, cz. The table contains 27 rows of data. Below the table, there is a "TOPCAT Table Browser" window showing a table with columns: sourceID, cIdEventID, frameSetID, ra, dec, cx, cy, cz. The table contains 27 rows of data.

Known Issues with current OSA

- Band-merging of *detections* to create *sources*
- SQL vs ADQL
- Quality Control

Source merging in WSA & VSA

- Look at images in all bands

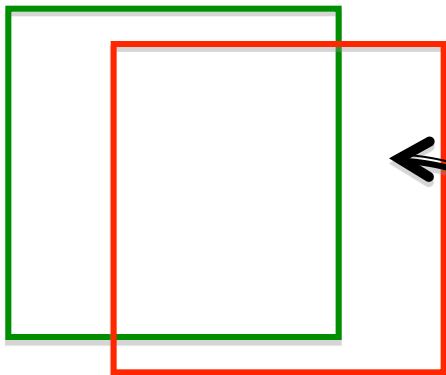


- Band-merge *within* framesets

- Assumes overlap > pointing offsets between A & B

Source merging in ATLAS

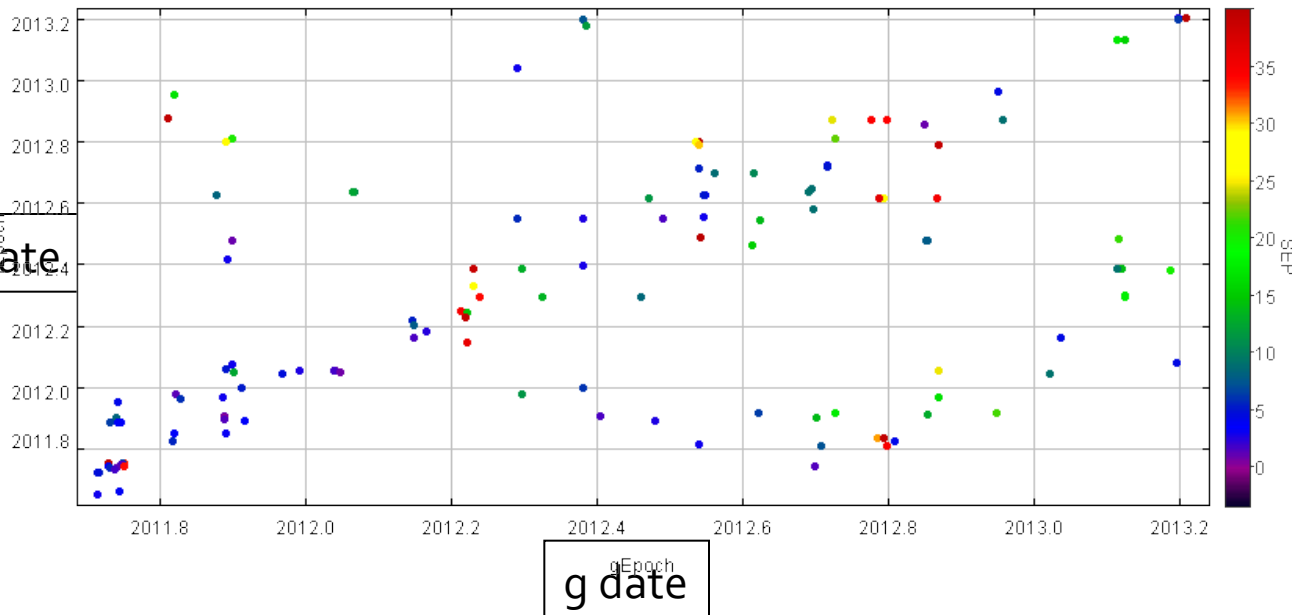
- Several complications w.r.t. WFCAM & VIRCAM
 - ATLAS survey design has quite small field overlaps
 - OmegaCAM has quite small detectors
 - More of the sky is near the edge of a field
 - Intermittent periods with large pointing offsets



r band detections should be merged with g band detections in the neighbouring frameset

Unmatched ATLAS sources

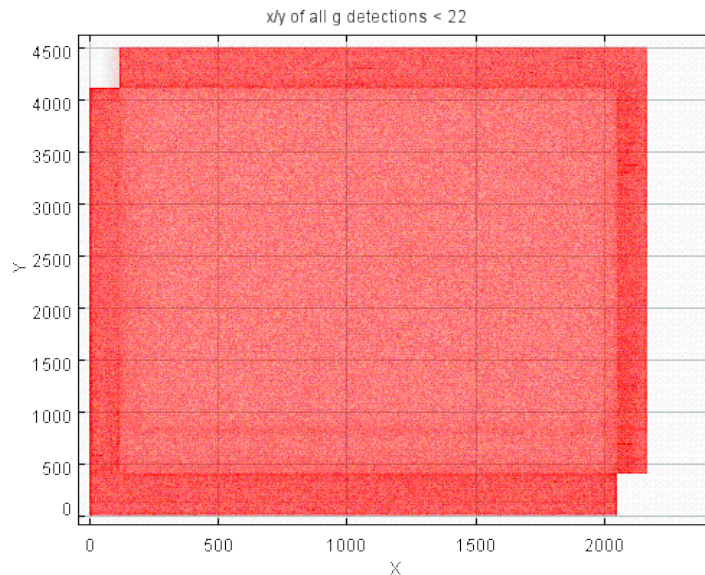
- Pointing offsets between g and r band



- Testing code for proposed solution
 - Define additional framesets & merge within them
 - Remove duplicate sources

How serious a problem is this?

- Dither regions show spurious detections

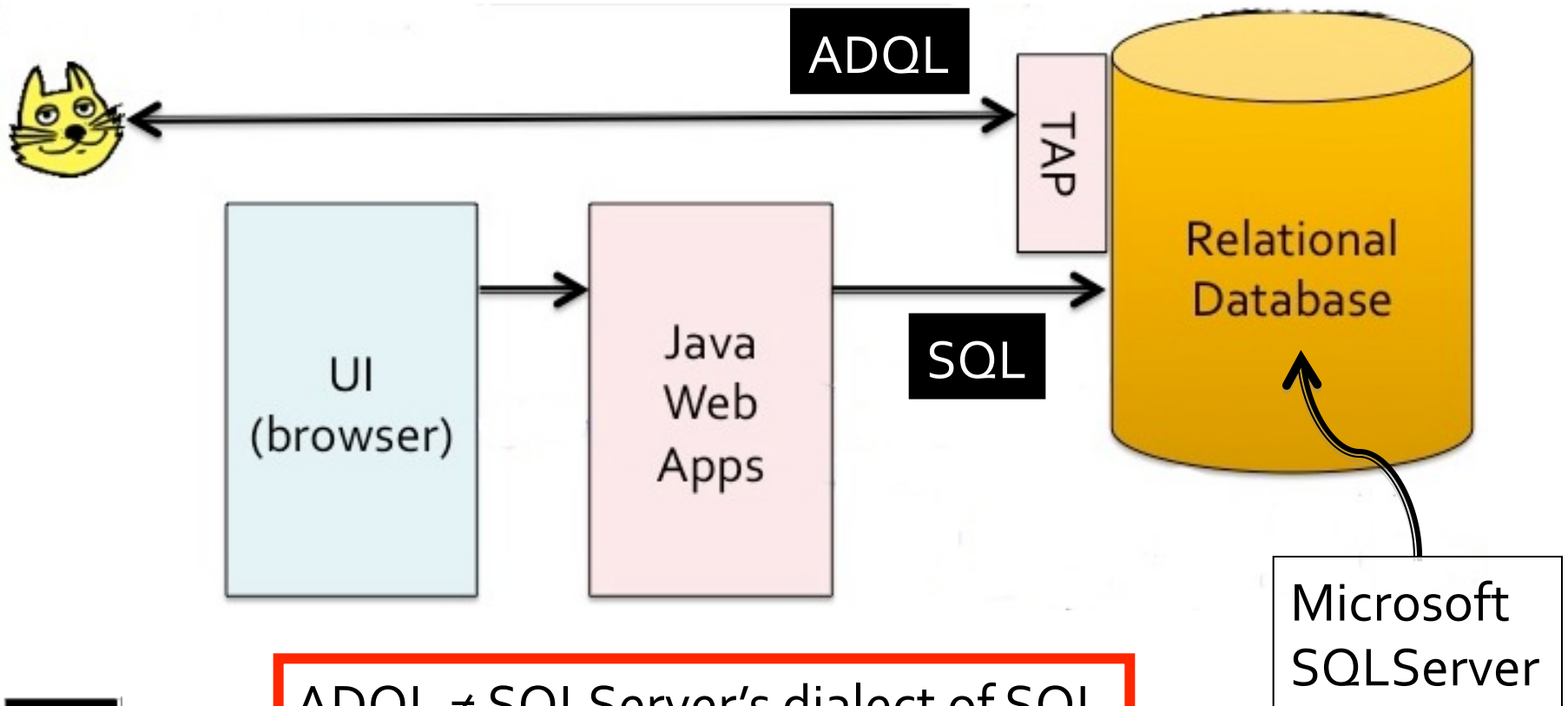


(x,y) for all g <22 detections

- Reduce no. of unpaired sources by factor ~ 5 by excluding dither regions
 - Get more gaps in coverage
- Given ATLAS survey strategy, trade-offs have to be made in science analyses
 - OSA will let you choose

SQL vs ADQL

ADQL: Astronomy Data Query Language



ADQL \neq SQLServer's dialect of SQL

SQL vs ADQL

- Slight syntax differences between languages
 - ADQL = **SQL92 standard** + astro-specific add-ons
 - SQLServer's SQL = **SQL92** + vendor-specific add-ons
- Some SQLServer SQL queries are not valid ADQL
 - Some valid WSA/VSA queries won't work on OSA
- We're fixing our ADQL parser to let them through
 - Let us know if you find a query that won't translate

Quality Control

- We currently
 - Deprecate images & derived catalogues on the basis of ESO grade, using rules agreed with Nigel Metcalfe
 - Remove repeat observations
- Do you want us to do more/different QC?

Conclusions

- Look at *osa.roe.ac.uk*
- Request login credentials from Nigel Metcalfe
- Email *osa-support@roe.ac.uk*
- Breakout session on Wednesday?